

WHAT IS CLAIMED IS:

1. A digital printing machine comprising:

a rigid frame;
a first linear motion X axis stage mounted on said frame;
a second linear motion X axis stage mounted on said frame parallel to said first axis stage, and arranged for operation independently of said first axis stage;
a printing table assembly movable on each said linear X axis stage;
a linear motion Y axis stage mounted on said frame perpendicular to said linear X axis stages, above said printing table assemblies; and
an array of inkjet nozzles mounted on said linear Y axis stage for linear motion perpendicular to said X axis stage.
2. The printing machine of claim 1, wherein each said printing table assembly comprises a media-holding plate and an openable cover pivotally coupled to said media-holding plate for holding said media firmly against said plate.
3. The printing machine according to claim 2, wherein said media-holding plate includes a raised portion, and said cover includes a window of the same shape and slightly larger than said raised portion.
4. The printing machine according to claim 1, wherein said linear motion X axis stage is a linear motor driven stage.
5. The printing machine according to claim 1, wherein said linear motion Y axis stage is a linear motor driven stage.
6. The printing machine according to claim 1, where at least part of each said printing table assembly is a vacuum table.
7. The printing machine according to claim 1, wherein said inkjet nozzles include drop-on-demand piezoelectric inkjet nozzles.
8. The printing machine according to claim 1, wherein said inkjet nozzles include continuous piezoelectric inkjet nozzles.

9. The printing machine according to claim 1, further comprising a curing unit located above each said printing table assembly and arranged to cure ink on media on said printing table assembly.
10. The printing machine according to claim 9, wherein said curing unit is an infrared system.
11. The printing machine according to claim 9, wherein said curing unit is a hot air blowing unit.
12. The printing machine according to claim 1, further comprising an ironing unit located above each said printing table assembly and arranged to iron media on said printing table assembly.
13. A printing machine comprising:
 - a rigid frame;
 - a linear motion X axis stage mounted on said frame;
 - a printing table assembly movable on said linear X axis stage;
 - a linear motion Y axis stage mounted on said frame perpendicular to said linear X axis stage, above said printing table assembly;
 - an array of inkjet nozzles mounted on said linear Y axis stage for linear motion perpendicular to said X axis stage;
 - a curing unit located above said printing table assembly and arranged to cure ink on media on said printing assembly; and
 - an ironing unit located above said printing table assembly and arranged to iron media on said printing assembly before printing thereon.
14. The printing machine according to claim 13, wherein said curing unit is an infrared system.
15. The printing machine according to claim 13, wherein said curing unit is a hot air blowing unit.
16. The printing machine according to claim 13, wherein said printing table assembly comprises a media-holding plate and an openable cover pivotally coupled to said media-holding plate for holding said media firmly against said plate

17. The printing machine according to claim 16, wherein said media-holding plate includes a raised portion, and said cover includes a window of the same shape and slightly larger than said raised portion.
18. The printing machine according to claim 14, where at least part of said printing table assembly is a vacuum table.
19. The printing machine according to claim 14, wherein said printing table assembly is a flattened plate.
20. The printing machine according to claim 14, wherein said inkjet nozzles include drop-on-demand piezoelectric inkjet nozzles.
21. The printing machine according to claim 14, wherein said inkjet nozzles include continuous piezoelectric inkjet nozzles.
22. A printing machine comprising:
 - a rigid frame;
 - a linear motion X axis stage base mounted on said frame;
 - a first printing table assembly movable on said linear X axis stage base;
 - a second printing table assembly movable on said linear X axis stage base independently of said first printing table assembly;
 - a linear motion Y axis stage mounted on said frame perpendicular to said linear X axis stages, above said printing table assemblies; and
 - an array of inkjet nozzles mounted on said linear Y axis stage for linear motion perpendicular to said X axis stage.
23. The printing machine of claim 22, further comprising an ironing unit located above said printing table assemblies and arranged to iron media on said printing table assemblies.
24. The printing machine according to claim 22, further comprising a curing unit located above said printing table assemblies and arranged to cure ink on media on said printing table assemblies.

25. The printing machine according to claim 24, wherein said curing unit is an infrared system.
26. The printing machine according to claim 24, wherein said curing unit is a hot air blower.
27. The printing machine of claim 22, wherein said printing table assembly comprises a media-holding plate and an openable cover pivotally coupled to said media-holding plate for holding said media firmly against said plate.
28. The printing machine of claim 27, wherein said media-holding plate includes a raised portion, and said cover includes a window of the same shape and slightly larger than said raised portion.
29. The printing machine according to claim 22, where at least part of each printing table assembly is a vacuum table.
30. The printing machine according to claim 22, wherein said inkjet nozzles include drop-on-demand piezoelectric inkjet nozzles.
31. The printing machine according to claim 22, wherein said inkjet nozzles include continuous piezoelectric inkjet nozzles.
32. A printing system for printing on a surface comprising:
a printing head controllably mounted for printing onto selected locations of said surface; and
a controllable wetting applicator for wetting said selected locations prior to printing.
33. A printing system for printing on a surface comprising:
At least one printing apparatus comprising at least one ink applicator operative to print an image over at least a part of said surface; and
At least one wetting apparatus comprising at least one liquid applicator operative with said ink applicator to apply a wetting composition over at least a portion of said part of said surface prior to printing, said wetting composition being

capable of interfering with the engagement of a liquid ink composition with at least one binding site of said surface.

34. A printing system according to claim 33, further comprising at least one controller operative to control said at least one liquid applicator to apply said wetting composition onto selected parts of said surface.

35. A printing system according to claim 33, wherein said liquid applicator comprises at least one of a spraying nozzle, a dripping nozzle, a droplet injector, a drop-on-demand piezoelectric inkjet nozzle, a continuous piezoelectric inkjet nozzle, a roller pad, an offset printing stencil and a screen printing stencil.

36. A printing system according to claim 33, wherein said at least one ink applicator comprises at least one of a spraying nozzle, a dripping nozzle, a droplet injector, a drop-on-demand piezoelectric inkjet nozzle, a continuous piezoelectric inkjet nozzle, a roller pad, an offset printing stencil and a screen printing stencil.

37. A printing system according to claim 33, and further comprising at least one retractable bath carrying a thinner liquid, said thinner liquid operative to prevent said wetting composition from drying within said liquid applicator, said retractable bath positioned beneath said liquid applicator and operative to be retracted on demand to expose said liquid applicator to apply said wetting composition onto said surface.

38. A printing system according to claim 37, wherein said thinner liquid comprises said wetting composition.

39. A printing system according to claim 37, wherein said thinner liquid comprises aqueous solution.

40. A printing system according to claim 33, further comprising a curing unit located above each said printing table assembly and arranged to cure at least one of said wetting composition and said ink deposited on said surface.

41. A printing system according to claim 40, wherein said curing unit is an infrared system.

42. A printing system according to claim 40, wherein said curing unit is a hot air

blowing unit.

43. A printing system according to claim 33, further comprising an ironing unit controllably mounted to iron said surface.

44. A printing system according to claim 33, further comprising:
 a rigid frame;
 a linear motion X-axis mounted on said frame;
 at least one table assembly, operative to bear a printable medium, movable on said linear X-axis;
 a bridge mounted on said frame perpendicular to said linear X-axis, above said table assembly;
 said at least one liquid applicator mounted on said bridge, said at least one liquid applicator operative to apply a wetting composition onto said printable medium, said wetting composition being capable of interfering with the engagement of a liquid ink composition with at least one binding site of the surface of said printable medium;
 a linear motion Y-axis stage mounted on said frame perpendicular to said linear X-axis stages, above said printing table assembly; and
 said at least one ink applicator mounted on said linear Y-axis stage for linear motion perpendicular to said X-axis stage.

45. A printing system according to claim 33, further comprising:
 a rigid frame;
 a first linear motion X-axis stage mounted on said frame;
 a second linear motion X-axis stage mounted on said frame parallel to said first axis stage, and arranged for operation independently of said first axis stage;
 at least one table assembly, operative to bear a printable medium, movable on each said linear X-axis;
 a bridge mounted on said frame perpendicular to said linear X-axis, above said table assemblies;
 said at least one liquid applicator mounted on said bridge, over each of said X-axis, said at least one liquid applicator operative to apply a wetting composition onto said printable medium, said wetting composition being capable of interfering with the

engagement of a liquid ink composition with at least one binding site of the surface of said printable medium;

a linear motion Y-axis stage mounted on said frame perpendicular to said linear X-axis stages, above each of said printing table assemblies; and

said at least one ink applicator mounted on said linear Y-axis stage for linear motion perpendicular to said X-axis stage.

46. The printing system according to claim 45, wherein each said printing table assembly comprises a media-holding plate and an openable cover pivotally coupled to said media-holding plate for holding said media firmly against said plate.

47. The printing system according to claim 46, wherein said media-holding plate includes a raised portion, and said cover includes a window of the same shape and slightly larger than said raised portion.

48. The printing system according to claim 45, wherein said linear motion X-axis stage is a linear motor driven stage.

49. The printing system according to claim 45, wherein said linear motion Y-axis stage is a linear motor driven stage.

50. The printing system according to claim 45, where at least part of each said printing table assembly is a vacuum table.

51. The printing system according to claim 45, further comprising a curing unit located above each said printing table assembly and arranged to cure at least one of said wetting composition and said ink deposited on said printable medium mounted on said printing table assembly.

52. The printing system according to claim 51, wherein said curing unit is an infrared system.

53. The printing system according to claim 51, wherein said curing unit is a hot air blowing unit.

54. The printing system according to claim 51, further comprising an ironing unit located above each said printing table assembly and arranged to iron media on said

printing table assembly.

55. A printing system according to claim 33, and wherein said image is a photograph.

56. A printing system according to claim 33, wherein said surface comprises of at least one of fibrous material, porous material, material having a high surface tension with said liquid ink.

57. A pre-printing apparatus for preparing a surface for printing, comprising a controllable wetting applicator for wetting selected locations of said surface prior to printing.

58. A pre-printing apparatus for preparing a surface for printing, comprising at least one wetting apparatus comprising at least one liquid applicator operative to apply a wetting composition over at least a portion of said part of said surface prior to printing, said wetting composition being capable of interfering with the engagement of a liquid ink composition with at least one binding site of said surface.

59. A pre-printing apparatus according to claim 58, further comprising at least one controller operative to control said at least one liquid applicator to apply said wetting composition onto selected parts of said surface.

60. A pre-printing apparatus according to claim 58, wherein said liquid applicator comprises at least one of a spraying nozzle, a dripping nozzle, a droplet injector, a drop-on-demand piezoelectric inkjet nozzle, a continuous piezoelectric inkjet nozzle, a roller pad, an offset printing stencil and a screen printing stencil.

61. A pre-printing apparatus according to claim 58, and further comprising at least one retractable bath carrying a thinner liquid, said thinner liquid operative to prevent said wetting composition from drying within said liquid applicator, said retractable bath positioned beneath said liquid applicator and operative to be retracted on demand to expose said liquid applicator to apply said wetting composition onto said surface.

62. A pre-printing apparatus according to claim 61, wherein said thinner liquid comprises said wetting composition.

63. A pre-printing apparatus according to claim 61, wherein said thinner liquid comprises aqueous solution.
64. A pre-printing apparatus according to claim 58, further comprising a curing unit located above each said printing table assembly and arranged to cure at least one of said wetting composition and said ink deposited on said printable medium mounted on said printing table assembly.
65. A pre-printing apparatus according to claim 64, wherein said curing unit is an infrared system.
66. A pre-printing apparatus according to claim 64, wherein said curing unit is a hot air blowing unit.
67. A pre-printing apparatus according to claim 58, wherein said surface is said fibrous material, and said fibrous material comprises a textile fabric.
68. A pre-printing apparatus according to claim 67, wherein said textile fabric is selected from the group consisting of wool, silk, cotton, linen, hemp, ramie, jute, acetate, acrylic, lastex, nylon, polyester, rayon, viscose, spandex, metallic composite, carbon or carbonized composite, and any combination thereof.
69. A pre-printing apparatus according to claim 68, wherein said textile fabric comprises a garment.
70. A method for printing on a surface comprising the steps of:
providing said surface;
wetting selected areas of said surface using a controllable wetting apparatus;
and
printing over at least a part of said wetted area using a controllably mounted digital printing head
71. A method for printing on a surface comprising:
providing said surface to be printed;
applying a wetting composition over at least a portion of said surface prior to printing using at least one liquid applicator, said wetting composition being capable of

interfering with the engagement of a liquid ink composition with at least one binding site of said surface

executing printing an image over at least a part of said wetted surface using at least one ink applicator.

72. A method for printing on a surface according to claim 71, wherein said step of applying wetting composition comprises operating at least one of a spraying nozzle, a dripping nozzle, a droplet injector, a drop-on-demand piezoelectric inkjet nozzle, a continuous piezoelectric inkjet nozzle, a roller pad, an offset printing stencil and a screen printing stencil.

73. A method for printing on a surface according to claim 71, wherein said step of executing printing comprises operating at least one ink applicator comprises at least one of a spraying nozzle, a dripping nozzle, a droplet injector, a drop-on-demand piezoelectric inkjet nozzle, a continuous piezoelectric inkjet nozzle, a roller pad, an offset printing stencil and a screen printing stencil.

74. A method for printing on a surface according to claim 71, and further comprising:

a first step of providing a retractable bath comprising a thinner liquid, said thinner liquid operative to prevent said wetting composition from drying within said liquid applicator, said retractable bath positioned in a first position beneath said liquid applicator immersing the tip of said liquid applicator;

a step of exposing said liquid applicator, before executing said step of applying said wetting composition, by retracting said bath into a second position; and

a step of immersing, at least partially, said liquid applicator in said thinner liquid by restoring said first position of said bath after said step of executing wetting is finished.

75. A method for printing on a surface according to claim 71, and further comprising: at least one of the steps of:

curing said wetting composition prior to executing said step of printing; and
curing said ink after executing said step of printing.

76. A method for printing on a surface according to claim 71, and further

comprising a step of ironing said surface prior to executing said step of wetting said surface.

77. A method for printing on a surface according to claim 71, wherein said step of providing a surface comprises providing a surface that is at least one of fibrous material, porous material, material having a high surface tension with said liquid ink.

78. A method for printing on a surface according to claim 77, wherein said step of providing said surface comprises providing said fibrous material, and said providing said fibrous material comprises providing a textile fabric.

79. A method for printing on a surface according to claim 78, wherein said step of providing a textile fabric comprises selecting said textile fabric from the group consisting of wool, silk, cotton, linen, hemp, ramie, jute, acetate, acrylic, lastex, nylon, polyester, rayon, viscose, spandex, metallic composite, carbon or carbonized composite, and any combination thereof.

80. A method for printing on a surface according to claim 79, wherein said step of providing a textile fabric comprises providing a garment.

81. A method for printing on a surface according to claim 71, wherein at least one of said steps of providing said surface and wetting said surface is executed, at least partially, concurrently with at least one of said steps of printing said surface and curing said surface.